Contract No: EP-W-09-002
WA #: 077-RSBD-02MV

Region 2 RAC2
Remedial Action Contract

Final Work Plan, Volume 1

Pierson's Creek Site

Remedial Investigation/ Feasibility Study Oversight

Newark, New Jersey

November 16, 2018

624682

CDM Smith

REMEDIAL ACTION CONTRACT 2
FOR REMEDIAL RESPONSE, ENFORCEMENT OVERSIGHT,
CRITICAL REMOVAL ACTIVITIES AT SITES OF RELEASE OR
THREATENED RELEASE OF HAZARDOUS SUBSTANCES
IN EPA REGION 2

FINAL WORK PLAN
VOLUME 1

PIERSON'S CREEK SITE OPERABLE UNIT 2
REMEDIAL INVESTIGATION/ FEASIBILITY STUDY OVERSIGHT
NEWARK, NEW JERSEY
Work Assignment No. 077-RSBD-02MV

U.S. EPA CONTRACT NO. EP-W-09-002
Document Control No.: 3323-077-03708
November 16, 2018

Prepared for:
U.S. Environmental Protection Agency
290 Broadway
New York, New York 10007-1866

Prepared by:
CDM Federal Programs Corporation
14 Wall Street, Suite 1702
New York, New York 10005

REMEDIAL ACTION CONTRACT 2
FOR REMEDIAL RESPONSE, ENFORCEMENT OVERSIGHT,
CRITICAL REMOVAL ACTIVITIES AT SITES OF RELEASE OR
THREATENED RELEASE OF HAZARDOUS SUBSTANCES
IN EPA REGION 2

FINAL WORK PLAN
VOLUME 1

PIERSON'S CREEK SITE OPERABLE UNIT 2
REMEDIAL INVESTIGATION/ FEASIBILITY STUDY OVERSIGHT
NEWARK, NEW JERSEY
Work Assignment No. 077-RSBD-02MV

U.S. EPA CONTRACT NO. EP-W-09-002
Document Control No.: 3323-077-03708
November 16, 2018

Prepared by: _____ Date: 11/16/2018
Joseph Mayo, CHMM
Site Manager

Approved by: _____ Date: 11/16/2018
Jeanne Litwin, PMP, REM
RAC2 Program Manager

Table of Contents

Acronyms ..... **v**

Section 1 Introduction **1-1**

1.1 Purpose 1-1
1.2 Site Background 1-1
1.2.1 Site Location 1-1
1.2.2 Site History 1-2
1.2.3 Site Characterization Summary 1-3
1.2.3.1 Soil and Material 1-3
1.2.3.2 Groundwater Investigation 1-3
1.3 Summary of RI/FS Oversight Requirements 1-4
1.4 Work Plan Contents 1-4

Section 2 Work Plan Rationale **2-1**

2.1 Development of the Technical Approach 2-1
2.2 Project Organization 2-1
2.3 Quality Assurance 2-1
2.4 Project Schedule 2-2
2.5 Green Remediation Practices 2-2

Section 3 Task Plans **3-1**

3.1 Task 1 – Project Planning and Support 3-1
3.1.1 Project Administration 3-1
3.1.2 Attend Scoping Meeting 3-2
3.1.3 Conduct Site Visit 3-2
3.1.4 Develop Draft Work Plan and Associated Cost Estimate 3-2
3.1.5 Negotiate and Prepare Final RI/FS Oversight Work Plan/Budget 3-3
3.1.6 Evaluate Existing Data and Documents 3-3
3.1.7 Quality Assurance Project Plan 3-3
3.1.8 Health and Safety Plan 3-3
3.1.9 Non-RAS Analyses 3-4
3.1.10 Meetings 3-4
3.1.11 Subcontract Procurement 3-4
3.1.12 Perform Subcontract Management 3-4
3.2 Task 2 – Community Involvement 3-4
3.2.1 Community Interviews 3-4
3.2.2 Community Relations Plan 3-4
3.2.3 Public Meeting Support 3-5
3.2.4 Fact Sheet Preparation 3-5
3.2.5 Proposed Plan Support 3-5
3.2.6 Public Notices 3-5
3.2.7 Information Repositories 3-5
3.2.8 Site Mailing List 3-5
3.2.9 Responsiveness Summary Support 3-5

3.3 Task 3 – Data Acquisition and RI/FS Oversight 3-6
3.3.1 Mobilization and Demobilization Oversight 3-6
3.3.2 Field Investigation Oversight 3-6
3.3.2.1 Mobilization and Demobilization 3-6
3.5.2.2 Prepare and Ship Environmental Samples 3-7
3.5.2.3 Develop Data Quality Objectives (DQO) 3-7
3.3.3 RI/FS Field Investigation Oversight Reports 3-7
3.4 Task 4 – Analysis of Split Samples 3-7
3.4.1 Preform Screening-Type Laboratory Sample Analysis 3-7
3.4.2 CLP-Type Laboratory Sample Analysis 3-7
3.4.3 Non-Routine Analytical Services 3-7
3.5 Task 5 – Analytical Support and Data Validation of Split Samples 3-7
3.5.1 Prepare and Ship Environmental Samples 3-8
3.5.2 Develop Data Quality Objectives (DQO) 3-8
3.5.3 Analytical Services Oversight 3-8
3.5.4 Coordinate with appropriate Sample Management Personnel 3-8
3.5.5 EPA-Approved Laboratory Quality Assurance Program 3-8
3.5.6 Sample Management 3-8
3.5.7 Data Validation 3-8
3.5.8 Review Data 3-8
3.5.9 Data Validation Reports 3-8
3.6 Task 6 – Data Evaluation of Split Samples 3-8
3.6.1 Data Usability Evaluation and Field QA/QC 3-9
3.6.2 Data Reduction, Tabulation, and Evaluation 3-9
3.6.3 Modeling 3-9
3.6.4 Data Evaluation Report 3-10
3.7 Task 7 – Review of PRP Risk Assessment 3-10
3.7.1 Human Health Risk Assessment 3-10
3.7.2 Ecological Risk Assessment 3-11
3.8 Task 8 – Treatability Study and Pilot Testing Oversight - Optional 3-12
3.8.1 Review PRP Work Plan for Treatability Study/ Pilot Test - *Optional* 3-13
3.8.2 Bench Test Oversight (Split Sampling) – Optional 3-13
3.8.3 Prepare Field Investigation Oversight Reports – Optional 3-13
3.8.4 Pilot Scale Test Oversight – *Optional* 3-13
3.8.5 Prepare Pilot Scale Test Oversight Reports – *Optional* 3-13
3.8.6 Field Test Oversight – *Optional* 3-13
3.8.7 Prepare Field Test Oversight Reports – *Optional* 3-13
3.8.8 Review PRP's Treatability Study Report – *Optional* 3-13
3.9 Task 9 – Review of the PRP's Remedial Investigation Report 3-14
3.9.1 Review PRP's Draft RI Report 3-14
3.9.2 Review PRP's Final RI Report 3-14
3.10 Task 10 – Remedial Alternatives Screening 3-14
3.10.1 Review PRP's Draft Technical Memorandum 3-14
3.10.2 Establish Remedial Action Objectives 3-14
3.10.3 Establish General Response Actions 3-14
3.10.4 Identify & Screen Applicable Remedial Technologies 3-14

3.10.5 Review PRP Remedial Alternatives in Accordance with NCP 3-15
3.10.6 Review of PRP's Remedial Alternatives for Effectiveness, Implementability, and Cost 3-15
3.10.7 Review of PRP's Final Technical Memorandum 3-15
3.11 Task 11 Review PRP's Remedial Alternatives Evaluation 3-15
3.12 Task 12 Review PRP's FS Report 3-15
3.12.1 Review PRP's Draft FS Report 3-16
3.12.2 Review PRP's Final FS Report 3-16
3.13 Task 13 Post RI/FS Support 3-16
3.14 Task 14 - Work Assignment Closeout 3-16
3.14.1 Document Indexing 3-16
3.14.2 Document Retention/Conversion 3-17

Section 4 References 4-1

List of Tables

Table 3-1 Remedial Investigation Sample List

List of Figures

Figure 1-1 Site Location Map
Figure 1-2 Site Map
Figure 2-1 Project Organization
Figure 2-2 Project Schedule

This page intentionally left blank.

Acronyms

amsl	above mean sea level
ARAR	Applicable or Relevant and Appropriate Requirement
ASC	analytical services coordinator
ASQ CQA	American Society of Quality Certified Quality Auditor
bgs	below ground surface
CDM Smith	CDM Federal Programs Corporation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	code of federal regulations
CHMM	certified hazardous materials manager
CIH	certified industrial hygienist
CLP	Contract Laboratory Program
CO	contracting officer
COC	chain of custody
COPC	contaminant of potential concern
CRP	community relations plan
DESA	Division of Environmental Science and Assessment
DPM	deputy program manager
DQO	data quality objective
EDD	electronic data deliverable
EDP	EQuIS data processor
EPA	United States Environmental Protection Agency
EPH	extractable petroleum hydrocarbons
EQuIS	environmental quality information systems
FASTAC	Field and Analytical Services Teaming Advisory Committee
FS	feasibility study
gpd	gallons per day
HASP	health and safety plan
mg/kg	milligram per kilogram
NCP	national contingency plan
NFA	no further action
NJDEP	New Jersey Department of Environmental Protection
ODCs	other direct costs
OSWER	Office of Solid waste and Emergency Response
OU	operable unit
PAH	polyaromatic hydrocarbons
PCB	polychlorinated biphenyls
PE	professional engineer
PG	professional geologist
PO	project officer
PMP	project management professional
PRP	potentially responsible party
PVSC	Passaic Valley Sewerage Commission

QA	quality assurance
QAPP	quality assurance project plan
QAS	quality assurance specialist
QC	quality control
QMP	quality management plan
RA	remedial action
RAO	remedial action objective
RAC	remedial action contract
RACMIS	RAC Management Information System
RAS	routine analytical services
REM	registered environmental manager
RI	remedial investigation
RI/FS	remedial investigation/feasibility study
ROD	record of decision
RPM	remedial project manager
RSCC	regional sample control coordinator
SAP	sampling analysis plan
SCR	site characterization report
SM	site manager
SMO	sample management office
SOW	statement of work
SVOC	semivolatile organic compound
Troy Chemical	Troy Chemical Corporation, Inc.
UFP	uniform federal policy
µg/L	microgram per liter
VOC	volatile organic compound
WA	work assignment
WBS	work breakdown structure
WWTP	Waste Water Treatment Plant

Section 1
Introduction

CDM Federal Programs Corporation (CDM Smith) received Work Assignment (WA) 077-RSBD-02MV under the Remedial Action Contract (RAC) 2, United States Environmental Protection Agency (EPA) Region 2, to provide Remedial Investigation (RI)/Feasibility Study (FS) Oversight at Operable Unit (OU) 2 of the Pierson's Creek Superfund Site ("the Site") located in Newark, New Jersey. The RI/FS for the site is being implemented by the Potentially Responsible Party (PRP), Troy Chemical Corporation, Inc. (Troy Chemical).

1.1 Purpose

This Final Work Plan describes the requirements for conducting oversight of the PRP's RI/FS to select a remedy to eliminate, reduce, or control risks to human health and the environment. CDM Smith's objective is to support EPA by overseeing the PRP's performance with the minimum amount of sampling necessary to complete the characterization of the Site so that these data are sufficient for EPA to select an approach for site remediation, and to prepare a Record of Decision (ROD) for the Site.

CDM Smith's RI/FS oversight activities will be conducted in accordance with the following documents:

- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended
- Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (EPA 1988)
- Contaminated Sediment Remediation Guidance for Hazardous Waste Sites (EPA 2005a)
- Other applicable federal, state, and local requirements
- Settlement Agreement between EPA and Troy Chemical

This WA requires CDM Smith to observe and document whether the PRPs have complied with all applicable laws, regulations, and requirements, and have met all performance standards specified in their EPA-approved planning documents and other applicable EPA policy, guidance, and regulations.

1.2 Site Background

1.2.1 Site Location

The Site consists of the Troy Chemical property and Pierson's Creek, an approximately 1.5-mile man made ditch, in Newark, New Jersey. Troy Chemical is a 6.11-acre property with a history of chemical manufacturing. Pierson's Creek runs north to south through the central portion of the Troy Chemical property and extends approximately 1.5 miles to the Port Newark Channel of

Newark Bay. The creek has been used as an urban stormwater drainage structure for more than 100 years, and it continues to be a component of the City of Newark's storm water management system. The creek historically surfaced from a 36-inch stormwater culvert just to the north of Troy Chemical, and flowed in the concrete channel that bisects the Troy Chemical facility. An unnamed, intermittent tributary flowed along the eastern property boundary and joined Pierson's Creek just south of the facility where the creek then extended to the Port Newark Channel of Newark Bay. Since a drainage improvement in 2007, the perennial portion of Pierson's Creek now begins just south of Troy Chemical facility. The portion of the creek on the Troy Chemical property has been blocked at both ends and has been covered as a temporary measure to limit precipitation from entering the creek.

The Site has been separated into two OUs. OU2 is defined as all site features on the Troy Chemical property, and OU1 encompasses the rest of the Site. This work plan is focused on OU2. A site location map and site area map are provided as Figure 1-1 and Figure 1-2, respectively.

1.2.2 Site History

A brief summary of the site history of Troy Chemical is provided below. A more detailed presentations of historical investigation activities at Troy Chemical is provided in the *Technical Memorandum – Summary of Existing Information and Data Gap Analysis for the Pierson's Creek Site* (CDM Smith 2017).

Troy Chemical is a specialty chemicals manufacturer that has been in operation since the 1880s. Chemicals produced at the property have included ultramarine, aniline, and coal tar dyes as well as metallic soaps, paint dryers, mercuric oxide, and fungicides. The property was acquired by the present-day owner and operator in 1980, although the company operated under the Troy Chemical Company name beginning in 1953.

Troy Chemical has discharged mercury-bearing wastewaters directly to Pierson's Creek without any treatment until 1965, when a mercury pretreatment system was installed at the edge of the creek. From 1965 to 1976, Troy Chemical continued to discharge mercury bearing wastewaters to Pierson's Creek, as the sulfide precipitation system did not completely remove the mercury from the water. In 1976, the facility began diverting effluent from the mercury pretreatment system to the facility's wastewater treatment plant (WWTP) where wastewater was treated by settling, removal of suspended soils and oil, and neutralization before subsequent discharge to the Passaic Valley Sewerage Commission (PVSC) system. In 1979, Troy Chemical's mercury contribution to the PVSC wastewater was tested and found to be approximately 327 pounds of mercury per day, revealing that the additional levels of treatment did not completely remove the mercury from the water. In 1986, over a 91-day period, Troy Chemical discharged an average of more than 30,000 gallons per day (gpd) to the PVSC sewer system. Troy Chemical reported that it ceased discharging mercury-containing process water to the sewer effluent as of February 1, 1987.

Groundwater, surface water, soil, air, and sediment on Troy Chemical have been the subject of extensive characterization performed during the various site inspections, RIs, and remedial actions (RAs) conducted under the regulatory authority of the New Jersey Department of Environmental Protection (NJDEP). A number of contaminants including volatile organic

compounds (VOCs), semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons, pesticides, polychlorinated biphenyls (PCBs), and metals have been detected in various media.

1.2.3 Site Characterization Summary

Troy Chemical submitted a Site Characterization Report (SCR) for the Site to EPA in November 2016. The SCR summarized previous investigations, treatability study results, and previous remedial actions. Key results of the SCR are summarized below.

1.2.3.1 Physical Setting

Previous investigations have defined the physical setting of the Site including site topography, drainage, surface water bodies, and general geology and hydrogeology. The Site is located within the Elizabeth, New Jersey, United States Geological Survey (USGS) 7.5-minute topographic quadrangle. The area is generally flat with surface elevations less than 10 feet above mean sea level (amsl). Surface water drainage at the Site is generally towards Pierson's Creek and its associated wetlands.

Previous investigations found that most of the Site area is constructed on historic fill consisting of ash, cinder, and construction debris, extending to a depth of 7 to 9 feet below ground surface (bgs). Below the historic fill layer, there is a 1 to 1.5 feet thick layer of highly organic marsh deposits with low permeability, referred to as a meadow mat. A low permeability glacial till and glacial deposits layer is observed below the meadow mat, extending to approximately 70 feet bgs, just above bedrock. Bedrock at the Site is part of the Passaic Formation and is identified by reddish-brown to brownish-red sandy mudstone, silty to sandy mudstone, and siltstone interbedded with lenticular sandstone. In previous investigation, groundwater was encountered at approximately 2 to 4 feet bgs within the historic fill layer, indicating potential interaction between surface water and groundwater.

1.2.3.2 Soil and Material

PCBs (up to 276 milligrams per kilogram [mg/kg]) and VOCs (up to 10,000 mg/kg) were identified in soil and concrete ditch and culvert material. In addition, elevated concentrations of benzene, mercury, and lead were measured near the concrete ditch and culvert. The SCR indicated that impacted soil and material at the Site are contained below existing barriers and structures. The materials in the concrete ditch and culvert are currently covered as a temporary measure to limit precipitation from entering the ditch.

1.2.3.3 Groundwater Investigation

Shallow Groundwater

In general, VOCs in shallow groundwater had elevated concentrations near the concrete ditch/culvert. VOCs were measured at concentrations greater than 10,000 micrograms per liter (µg/L). Elevated concentrations of benzene (up to 10,000 µg/L) were also measured near the concrete ditch/culvert. Lead (up to 213 µg/L) was measured in an upgradient well screened in the peat layer. Mercury (up to 87 µg/L) was also measured in an upgradient well screened in a meadow mat. No PCBs were detected in shallow groundwater samples.

Deep Groundwater

In 2002, NJDEP designed a conditional no further action (NFA) for the deep groundwater at Troy Chemical. The SCR indicated that vertical groundwater migration is limited due to the low permeability and high organic content of the meadow mat and that the low permeability of the glacial till below the site limits horizontal migration of groundwater.

1.3 Summary of RI/FS Oversight Requirements

The scope for the RI/FS oversight for the Site is defined in the EPA Statement of Work (SOW) dated March 14, 2018. The major elements of the RI/FS Oversight are summarized below. Descriptions of the specific tasks to be performed during the RI/FS Oversight are provided in Section 3 (Task Plans), which follows the work breakdown structure (WBS) of the EPA SOW with some changes made based on the scoping meeting discussion with EPA.

Perform Field Investigation Oversight - CDM Smith will perform field oversight and accept split samples for analysis during the PRP's RI/FS investigation. CDM Smith will ensure that all field activities are performed in accordance with the requirements of the ROD, the Settlement Agreement, and associated RI/FS SOWs, Quality Assurance Project Plan (QAPP), Health and Safety Plan (HASP), and other applicable documents.

PRP Document Review - CDM Smith will review the PRP's documents including the human health and ecological risk assessment reports, treatability study and pilot testing reports, RI report, remedial alternatives screening memorandum, remedial alternatives evaluation document, and FS report. Documents will be reviewed to ensure that they comply with the ROD; Settlement Agreement and associated RI/FS SOWs, Applicable or Relevant and Appropriate Requirements (ARARs), standard professional engineering practices, applicable statues, and EPA policy, guidance, and regulations.

1.4 Work Plan Contents

This work plan contains four sections, as described below.

Section 1	Introduction - The introductory section describes the objectives and overall requirements of the RI/FS oversight. The format of the work plan and a summary of relevant site background information are also provided.
Section 2	Work Plan Rationale - This section includes the approach CDM Smith will use to evaluate the effectiveness of the PRP design and describes applicable green remediation practices for the Site.
Section 3	Task Plans - This section describes the specific tasks of the RI/FS oversight in accordance with the EPA SOW for the Site and discussions with EPA.
Section 4	References - The references used to develop material presented in this work plan are listed in this section.

Section 2
Work Plan Rationale

2.1 Development of the Technical Approach

The primary activities of this WA are to perform field oversight and split sampling during the RI/FS field investigation and to provide technical review and comment on the PRP's risk assessments, treatability and pilot testing, RI/FS, and remedial alternatives evaluation submittals. CDM Smith will ensure that all submittals meet the requirements of the documents, regulations, and policy cited in Section 1.1.

Field oversight and document review will be performed for the Site in accordance with the Settlement Agreement and associated SOWs. A breakdown of the anticipated field oversight activities is provided in Section 3.3.2. A breakdown of the anticipated documents that will be reviewed is provided in Sections 3.7 through 3.12.

2.2 Project Organization

The proposed project organization is shown in Figure 2-1.

2.3 Quality Assurance

All work by CDM Smith on this WA will be performed in accordance with *the CDM Smith RAC2 Quality Management Plan (QMP)* (January 2018).

The RAC2 quality assurance specialist (QAS) will maintain quality assurance (QA) oversight for the duration of the WA. A CDM Smith QAS has reviewed this work plan for QA requirements. A site-specific QAPP governing field oversight and split sampling and analysis will be prepared in accordance with the Uniform Federal Policy (UFP) for QAPPs and current EPA Region 2 guidance and procedures.

The CDM Smith site manager (SM) is responsible for implementing appropriate quality control (QC) measures on this WA. Such QC responsibilities include:

- Implementing the QC requirements referenced or defined in this work plan and in the QAPP Addendum
- Adhering to the CDM Smith RAC Management Information System (RACMIS) document control system
- Organizing and maintaining WA files
- Conducting planning meetings, as needed, in accordance with the RAC2 QMP
- Ensuring that the proper data quality objectives (DQOs) are implemented for the WA

Document control aspects of the program pertain to controlling and filing documents. CDM Smith has developed a program filing system that conforms to EPA's requirements to ensure that the documents are properly stored and filed. This system, which includes document receipt control procedures, will be implemented to control and file all documents associated with this WA.

2.4 Project Schedule

A detailed project schedule is included as Figure 2-2. The project schedule assumes the provision of adequate funding and timely review of documents by EPA throughout the project.

2.5 Green Remediation Practices

Green remediation is the practice of considering all environmental effects of the implementation of a remedy and incorporating options to maximize the net environmental benefit of cleanup actions. In accordance with EPA's strategic plan for compliance and environmental stewardship, EPA strives for cleanup programs that use natural resources and energy efficiently, reduce negative impacts on the environment, minimize or eliminate pollution at its source, and reduce waste to the maximum extent possible. EPA's Region 2 Superfund program supports the adoption of "green site assessment and remediation," which is defined as the practice of considering all environmental impacts of studies, selection, and implementation of a given remedy, and incorporating strategies to maximize the net environmental benefit of cleanup actions (see http://www.clu-in.org/greenremediation). In addition, EPA established a "Clean & Green" policy to enhance the environmental benefits of Superfund cleanups by promoting technologies and practices that are sustainable.

To the extent practicable, CDM Smith will explore and provide comments on the Respondent's plans as appropriate to implement green remediation strategies and applications in the performance of the requirements of this WA to maximize sustainability, reduce energy and water usage, promote carbon neutrality, promote industrial materials reuse and recycling, and protect and preserve land resources. CDM Smith will maintain record of green-related activities and will report this information to EPA in its monthly progress reports or as requested by the project officer (PO).

It is anticipated that the following practices will be implemented

- Obtain supplies and materials locally, where possible
- Work with local staff to reduce fuel consumption, such as using public transit to travel to and from site
- Minimize the number of sample shipments to the analytical laboratory (while still meeting the holding time requirements)

Section 3
Task Plans

This section describes in detail the work to be performed for the RI/FS oversight activities. The tasks identified in this section are based on EPA's SOW for the Site, dated March 14, 2018; a scoping meeting with EPA held on March 20, 2018; and subsequent discussions with EPA.

3.1 Task 1 – Project Planning and Support

The project planning task involves several Subtasks that will be performed in order to execute the assignment including project administration, meetings, a site visit, a review of existing data and information, the work plan and cost estimate, and a site-specific QAPP and HASP.

3.1.1 Project Administration

The project administration activity involves regular duties performed by the CDM Smith SM and the program support personnel throughout the duration of this WA. CDM Smith will provide the following project administration support during the performance of this WA.

The SM will:

- Prepare the technical monthly reports
- Review weekly financial reports
- Review and update the project schedule
- Attend quarterly internal RAC II meetings
- Communicate weekly with EPA RPM
- Prepare staffing plans

The program support personnel will:

- Review WA technical/financial status
- Prepare reports for the Monthly Progress Report
- Provide technical resource management
- Review the WA budget
- Respond to questions from the EPA PO and Contracting Officer (CO)
- Prepare and submit invoices

3.1.2 Attend Scoping Meeting

On March 20, 2018 CDM Smith's Deputy Program Manager (DPM) and SM attended an initial scoping meeting conference call with the EPA RPM, PO, and CO to outline and discuss the project scope. Following the conference call, a scoping meeting summary and associated action items list was submitted to EPA on March 30, 2018.

3.1.3 Conduct Site Visit

The tasks associated with this Subtask are included under Subtask 3.3.2.

3.1.4 Develop Draft Work Plan and Associated Cost Estimate

CDM Smith has prepared this Work Plan in accordance with the RAC2 contract terms and conditions. CDM Smith used existing site data, information from EPA guidance documents, and technical direction provided by the EPA RPM as the basis for preparing this work plan.

This work plan includes a comprehensive description of project tasks, the procedures to accomplish them, project documentation, and a project schedule. CDM Smith uses internal QA/QC systems and procedures to ensure that the work plan and other deliverables are of professional quality requiring only minor revisions (to the extent that the scope is defined). Specifically, the Work Plan includes the following:

- Identification of RI/FS project elements including planning, design, and activity reporting documentation, field sampling and analysis activities, and treatability study activities. The detailed WBS corresponds to the WBS provided in the EPA SOW dated March 14, 2018 and as modified by the March 20, 2018 scoping meeting.
- CDM Smith's technical approach for each task to be performed, including a detailed description of each task, the assumptions used, any information to be produced during and at the conclusion of each task, and a description of the work products that will be submitted to EPA. Information is presented in a sequence consistent with the SOW.
- A schedule with specific dates for completion of each required activity and submission of each deliverable required by the SOW (Section 4). The schedule will also include information regarding timing, initiation, and completion of all critical path milestones for each activity and deliverable and the expected review time for EPA.
- A list of key CDM Smith personnel providing support on the project (Figure 2-1).
- CDM Smith prepared a draft work plan budget (Volume 2 of this work plan) that follows the WBS in the SOW. The draft work plan budget was negotiated with EPA November 5, 2018. The negotiated volume 2 work plan budget contains a cost breakdown, by subtask, of the negotiated direct labor costs, subcontractor costs, other direct costs (ODCs), projected fee, and any other specific cost elements required for performance of each subtask included in the EPA SOW. ODCs are broken down into individual cost categories as required for this WA, based on the specific cost categories negotiated under CDM Smith's RAC2 contract.

3.1.5 Negotiate and Prepare Final RI/FS Oversight Work Plan/Budget

CDM Smith attended a budget negotiation meeting with EPA via tele-conference on November 5, 2018. EPA and CDM Smith personnel discussed and agreed upon the costs required to accomplish the tasks outlined in the SOW. A final, negotiated Work Plan (Volume 2) incorporating the agreements made in the negotiation meeting is being submitted under separate cover. During the November 5, 2018 negotiation meeting, EPA approved the Draft Work Plan (Volume 1).

3.1.6 Evaluate Existing Data and Documents

In accordance with the EPA SOW, this Subtask is not applicable.

3.1.7 Quality Assurance Project Plan

To the extent possible, CDM Smith will use the QAPP developed for the Pierson's Creek OU1 site as the basis for developing the QAPP for this assignment. In addition, the PRP's QAPP for the RI/FS of OU2 will be referenced and adapted when creating the QAPP for the RI/FS oversight.

CDM Smith will prepare a site-specific QAPP in accordance with EPA QA/R-5 (latest draft/revision), UFP-QAPP Manual (EPA 2005b), Revision 1, Optimized UFP-WAPP Worksheets (EPA 2012), and current EPA Region 2 QAPP guidance and procedures, and CDM Smith's current approved QMP and QAPP for the RAC2 contract. It is assumed that a draft and final QAPP will be submitted.

The QAPP will describe the project objectives and organization, functional activities, and QA/QC protocols that will be used to achieve the desired DQOs for split-samples. The DQOs will, at a minimum, reflect the use of analytical methods for identifying and addressing contamination consistent with the levels for Remedial Action Objectives (RAOs).

In addition, the QAPP will describe the number, type, and location of samples to be collected and analyses to be performed to adequately oversee the PRP's efforts to delineate areas of contamination. The QAPP will include split sampling objectives; split sampling locations and frequencies; sampling equipment and procedures; and sample handling and analysis. The QAPP will be written so that a field team unfamiliar with the site would be able to perform the required field oversight activities. Any significant changes to the QAPP will be documented in a letter to the EPA RPM and EPA QA Officer.

CDM Smith will submit the QAPP after receipt and review of the PRP's Final QAPP.

3.1.8 Health and Safety Plan

CDM Smith will prepare a site-specific HASP that specifies employee training, personal protective equipment, medical surveillance requirements, standard operating procedures, and a contingency plan in accordance with 40 Code of Federal Regulations (CFR) 300.150 of the National Contingency Plan (NCP) 29 CFR 1910.120(1)(1) and (1)(2). To the extent possible, CDM Smith will use the HASP developed for the Pierson's Creek OU1 site as the basis for developing the HASP for this WA. In addition, CDM Smith will refer to the PRP's HASP developed for the RI/FS of OU2 whenever possible. A task-specific HASP will also be prepared to address health and safety requirements for site visits. CDM Smith will submit the HASP after receipt and review of the PRPs' Final HASP.

3.1.9 Non-RAS Analyses

It is assumed that a subcontract laboratory will not be required for the analysis of split samples. Therefore, this Subtask is not applicable.

3.1.10 Meetings

CDM Smith will participate in progress meetings during the WA. For budgeting purposes, it is assumed that CDM Smith will participate in 6 technical meetings, with 2 people in attendance, for 5 hours (including travel).

3.1.11 Subcontract Procurement

It is assumed that no subcontractors will be needed for the duration of the project.

3.1.12 Perform Subcontract Management

It is assumed that no subcontractors will be needed for the duration of the project.

3.2 Task 2 – Community Involvement

This task includes technical support provided by CDM Smith during public/availability meeting(s) under the associated community relations WA. All community involvement support activities will be conducted in accordance with *Superfund Community Involvement Handbook* (EPA 2016b).

3.2.1 Community Interviews

In accordance with the EPA SOW, this Subtask is not applicable.

3.2.2 Community Relations Plan

CDM Smith will prepare a draft and final community relations plan (CRP) which will address the following community relations activities:

- Draft CRP - CDM Smith will develop a draft CRP that presents an overview of the community's concerns and includes the following elements:
  - The Site background including location, description, and history
  - A community overview including a community profile, concerns, and involvement
  - Community involvement objectives and planned activities with schedule to accomplish those objectives
  - Mailing list of contacts and interested parties
  - Names and addresses of the information repositories and public meeting facility locations
  - List of acronyms and a glossary
- Final CRP – CDM Smith will submit a final CRP or revised CRP in accordance with final comments from EPA.

3.2.3 Public Meeting Support

CDM Smith will make arrangements for public meetings/availability sessions/open houses including the selection and reservation of a meeting space (as per technical direction from the EPA RPM). CDM Smith will attend public meetings or availability sessions, provide recording and/or stenographic support, prepare draft and final meeting summaries, and prepare presentation materials/handouts.

CDM Smith will develop draft visual aids (i.e. powerpoint slides and handouts) as instructed by EPA. For budgeting purposes, CDM Smith will assume a presentation of 15 slides and 1 handout for each public meeting. After receiving EPA comments, CDM Smith will prepare final visual aids.

CDM Smith will make arrangements for one site tour/meeting. CDM Smith will reserve a court reporter for the public meeting as directed by the EPA RPM. CDM Smith will prepare a full-page original and a "four on one" page copy, along with an electronic copy of the transcripts. Additional copies will be placed in the information repositories as required.

3.2.4 Fact Sheet Preparation

CDM Smith will prepare draft information letters/updates/fact sheets pending the findings in the CRP(s) or revised CRP(s) for the Site as per technical direction provided by the EPA RPM. CDM Smith will research, write, edit, design, lay out, and photocopy the fact sheets. CDM Smith will attach mailing labels to the fact sheets before delivering them to EPA from where they will be mailed. For budgeting purposes, CDM Smith assumes one fact sheet one to two pages in length with two illustrations per fact sheet. Upon receiving comments from EPA, CDM Smith will prepare final fact sheets incorporating all EPA comments.

3.2.5 Proposed Plan Support

In accordance with the EPA SOW, this Subtask is not applicable.

3.2.6 Public Notices

CDM Smith will prepare newspaper announcement(s)/public notice(s) in support of the various public meetings/site tour(s). CDM Smith assumes the development of one newspaper advertisement in the most widely read local newspaper(s). For budgeting purposes, CDM Smith assumes half the ads are placed in a large newspaper and the other half in a local newspaper.

3.2.7 Information Repositories

In accordance with the EPA SOW, this Subtask is not applicable.

3.2.8 Site Mailing List

CDM Smith will update the mailing list used for community relations activities for this site. It is assumed that the mailing list will be updated once and will have approximately 50 entries. Upon request, CDM Smith will provide mailing labels and an electronic copy of the mailing list to EPA. EPA will perform the actual mailing of any information to the community.

3.2.9 Responsiveness Summary Support

CDM Smith will provide administrative and technical support for the Site Responsiveness Summary. CDM Smith will provide assistance in compiling and summarizing comments received

during the public comment period on the Proposed Plan and Feasibility Study. For budgetary purposes, CDM Smith will assume 20 separate comments (including duplicate comments).

3.3 Task 3 – Data Acquisition and RI/FS Oversight

This task addresses CDM Smith's oversight of the PRP's work efforts and related field split sampling during the performance of the RI/FS. The purpose of the split sampling is to compare results with PRP data. The planning for this task is accomplished in Task 1, Project Planning and Support, whereby all of the necessary plans required to collect the field data are determined and arranged. This task begins with EPA's approval of the QAPP prior to the RI/FS and ends with demobilization of field personnel and equipment from the Site after the RI/FS is complete. CDM Smith will perform field activities in accordance with the EPA-approved QAPP described under Task 1. Before beginning field activities, EPA will consider conducting a meeting with all principal personnel to clarify objectives and communication channels to ensure the efficient use of available funds.

Task 3 includes the following activities:

- Mobilization and Demobilization
- Field Investigation Oversight
- Preparation of Field Investigation Oversight Reports

3.3.1 Mobilization and Demobilization Oversight

In accordance with the EPA SOW, this Subtask is not applicable.

3.3.2 Field Investigation Oversight

CDM Smith will ensure the proper management of split samples, including accurate chain-of-custody (COC) procedures for sample tracking, protective sample-packing techniques, and proper sample-preservation techniques. CDM Smith will ensure that the PRP characterizes and disposes of investigation-derived wastes in accordance with local, state and federal regulations as specified in the PRP's FSP.

CDM Smith will conduct a site visit with EPA prior to the initiation for field oversight activities to develop a basic understanding of the proposed RI/FS field investigation and requirements.

During the RI/FS field investigation, CDM Smith will accept split samples at a rate of 10 percent and submit samples for analysis. CDM Smith will coordinate with and utilize the Division of Environmental Science and Assessment (DESA) or CLP laboratories. For the purpose of this work plan, CDM Smith assumed that the PRP field investigations will take place over a period of 6 weeks, as dictated in the PRP's December 2017 RI/FS Work Plan. CDM Smith will provide verbal communications to the RPM at least once per week or more in the event that something critical needs to be communicated during the PRP's field work.

3.3.2.1 Mobilization and Demobilization

In accordance with the EPA SOW, this Subtask is not applicable. Mobilization activities required to support collection of split samples will be included under Subtask 3.3.2 Field Investigation

Oversight. This includes preparation of a field planning meeting agenda and conducting a field planning meeting.

3.5.2.2 Prepare and Ship Environmental Samples

Preparation and shipping of split samples is included under Subtask 3.3.2.

3.5.2.3 Develop Data Quality Objectives (DQO)

DQOs will be established in the QAPP under Subtask 3.1.7.

3.3.3 RI/FS Field Investigation Oversight Reports

CDM Smith will provide the following RI/FS field oversight reports:

- Periodic Reports: Bi-weekly field oversight reports will be prepared during periods when the PRP is actively performing field activities. Each report will include a short summary of significant field activities during the period, photographs of field activities, and copies of all field logs. Each field oversight report will be submitted within 5 calendar days after each 2-week reporting period.
- Final Summary Report: In accordance with the EPA SOW, a final summary report will not be prepared.

3.4 Task 4 – Analysis of Split Samples

Per EPA's direction, CDM Smith will utilize DESA or CLP laboratories for the analysis of all split samples. A subcontract laboratory will not be required. All samples will be analyzed in compliance with the EPA's Field and Analytical Services Teaming Advisory Committee (FASTAC) policy. It is assumed that all split samples will be analyzed for VOCs, SVOCs, metals, mercury, extractable petroleum hydrocarbons (EPH) and PCBs.

3.4.1 Preform Screening-Type Laboratory Sample Analysis

In accordance with the EPA SOW, this Subtask is not applicable.

3.4.2 CLP-Type Laboratory Sample Analysis

CDM Smith will request CLP analytical services in accordance with procedures outlined in the *Contract Laboratory Program Guidance for Field Samplers* (EPA 2014). The types of media will include surface soil, subsurface soil, shallow groundwater, intermediate/deep groundwater, and air. The anticipated list of samples including split samples is included as Table 3-1.

3.4.3 Non-Routine Analytical Services

Non-routine analytical services will not be requested for this project, and therefore, this Subtask is not applicable.

3.5 Task 5 – Analytical Support and Data Validation of Split Samples

This task includes sample management activities for samples collected under Task 3.

3.5.1 Prepare and Ship Environmental Samples

This Subtask is included under Subtask 3.3.2.

3.5.2 Develop Data Quality Objectives (DQO)

This Subtask is included under Subtask 3.1.7.

3.5.3 Analytical Services Oversight

This Subtask is not applicable. Analytical services oversight is not anticipated for this WA.

3.5.4 Coordinate with appropriate Sample Management Personnel

This Subtask is included under Subtask 3.5.6.

3.5.5 EPA-Approved Laboratory Quality Assurance Program

It is assumed that a subcontract laboratory will not be required for analysis of split samples. As a result, the EPA-Approved Laboratory QA program will not be utilized, and this Subtask is not applicable.

3.5.6 Sample Management

CDM Smith will provide sample management including COC procedures, information management, sample retention, and 10-year data storage.

For all Routine Analytical Services (RAS) activities, CDM Smith will notify the EPA Regional Sample Control Coordinator (RSCC) and Sample Management Office (SMO) to enable them to track the shipment of samples from the field to the laboratories and to ensure timely laboratory receipt of samples. Sample trip reports will be sent directly to RSCC and the EPA RPM within 10 working days of final sample shipment, with a copy sent to the CDM Smith Analytical Services Coordinator (ASC).

The CLP laboratories will be responsible for providing analytical data packages for data validation by EPA.

3.5.7 Data Validation

It is assumed that non-RAS split samples will not be collected. As a result, CDM Smith will not be performing data validation, and this Subtask is not applicable.

3.5.8 Review Data

The tasks associated with this Subtask are included under Subtask 3.6.1.

3.5.9 Data Validation Reports

It is assumed that non-RAS split samples will not be collected. As a result, CDM Smith will not be performing data validation, and this Subtask is not applicable.

3.6 Task 6 – Data Evaluation of Split Samples

This task involves comparison of the PRP's RI/FS data with CDM Smith's split sample results. Data evaluation begins with the receipt of analytical data under Task 5 and ends with the submission

of the Data Evaluation Summary Report. CDM Smith will compare, evaluate, interpret, and tabulate data in an appropriate presentation format for final data tables. CDM Smith will perform a detailed comparison of the split sample data results with the data provided by the PRP and submit a report of the results for review by EPA. As part of this effort, CDM Smith will organize and evaluate all the data gathered during the OU2 field investigation. CDM Smith will perform the activities in the Subtasks below.

3.6.1 Data Usability Evaluation and Field QA/QC

CDM Smith will evaluate the usability of the RI/FS split sample data, including any uncertainties associated with the data. CDM Smith will apply the appropriate QA/QC protocols, including applying relevant information in the Data Quality Assessment: A Reviewer's Guide (EPA 2006) and Section 5 of the QAPP Manual, to evaluate whether the data are appropriate for their intended use.

3.6.2 Data Reduction, Tabulation, and Evaluation

CDM Smith will evaluate, interpret, and tabulate the split sample data in an appropriate presentation format for final data tables. Tables will be organized in a logical manner. The analytical tables will indicate the sample collection dates. Reporting limits will be indicated in instances where a parameter was not detected.

CDM Smith will use the Environmental Quality Information Systems (EQuIS) database to manage analytical data. This includes split sample results and the corresponding PRP's data. It is assumed that the PRP's data will be provided in Region 2 Electronic Data Deliverable (EDD) format. The system will provide data storage, retrieval, and analysis capabilities, and will be capable of interfacing with a variety of spreadsheet, statistical, and graphics software packages. Data collected will be organized, formatted, and input into the database for use in the data evaluation report described in Section 3.6.4. QC checks of all data entry will be performed throughout the project.

CDM Smith will submit split sampling data in the EPA Region 2 standardized EDD format to streamline the electronic submittal process. CDM Smith will provide electronic submittals of field and laboratory analytical results in accordance with EPA Region 2's policies, guidelines, and formats.

EPA Region 2's *Electronic Data Deliverable (EDD) Comprehensive Specification Manual 4.0* (EPA 2016a) explains the systematic implementation of EDD within Region 2 and provides detailed instructions for data preparation and identification of data fields required for data submissions. Additional Region 2 EDD guidance and requirements documents, including the *Electronic Data Deliverable Valid Values Reference Manual* (EPA 2015) and tables, the *Basic Manual for Historic Electronic Data* (EPA 2018), the *Standalone EQuIS Data Processor (EDP) User Guide* (EarthSoft Inc. 2008), and EDD templates can be found at https://www.epa.gov/superfund/region-2-superfund-electronic-data-submission.

3.6.3 Modeling

In accordance with the EPA SOW, this Subtask is not applicable.

3.6.4 Data Evaluation Report

The Data Evaluation Report will summarize the results of split samples collected during the RI/FS oversight. CDM Smith will compare the data to the PRP's data, discuss any discrepancies, and present the results for review and approval by the EPA RPM. Data Evaluation Reports will be submitted in electronic and hard copy formats.

CDM Smith will attend a conference call with EPA to discuss data evaluation results and possible next steps.

3.7 Task 7 – Review of PRP Risk Assessment

This task covers requirements for review and comment on the PRP's Risk Assessment submittals. The Risk Assessment will determine whether site contaminants pose a current or potential risk to human health and the environment in the absence of any remedial action. The PRP's Risk Assessments will be reviewed to assess whether they were completed in accordance with the guidance, procedures, assumptions, methods, and formats contained in:

- Human Health Evaluation Manual Supplemental Guidance: "Standard Default Factors" Office of Solid Waste and Emergency Response (OSWER) Directive 9285.6-03 (EPA 1991)
- EPA Regional guidance as specified
- Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation (Part A) Interim Final (EPA 1989b)
- Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation (EPA, 1989a)
- Guidance for Data Usability in Risk Assessment (EPA 1990)
- Air/Superfund National Technical Guidance Study Series Volumes I, II, III, IV (EPA 1989c)
- Ecological Assessment of Hazardous Waste Sites: A Field Laboratory Reference Document (EPA 1989d)

The Baseline Risk Assessment will include two components: The Human Health Risk Assessment and the Ecological Risk Assessment.

3.7.1 Human Health Risk Assessment

CDM Smith will review and provide comments on the PRP's evaluation of the risk to human health posed by the site contaminants.

CDM Smith will review the following reports:

- Draft Human Health Risk Assessment Report. CDM Smith will review this report and ensure that it addresses the following appropriately:
    - Hazard Identification (sources): Contaminants of potential concern (COPCs) will be identified, described, and selected based on their intrinsic toxicological properties.

- Characterization of Site and Potential Receptors: Human populations will be identified and characterized in the exposure pathways.
- Exposure Assessment: The exposure assessment will identify the magnitude of actual or potential human exposures, the frequency and duration of these exposures, and the routes of which receptors are exposed.
- Toxicity Assessment: All toxicity values (slope factors and reference doses) for the COPCs and the sources of the toxicity values will be provided, in accordance with EPA's current toxicity hierarchy.
- Risk Characterization: Chemical-specific toxicity information, combined with quantitative and qualitative information from the exposure assessment, will be compared to measured levels of contaminant exposure and the levels predicted through environmental fate and transport modeling. These comparisons will determine whether concentrations of contaminants at or near the site are affecting or could potentially affect human health.
- Identification of Limitations/Uncertainties: Critical assumptions and uncertainties (e.g., background concentrations and conditions, modeling inputs, toxicity data, environmental data, etc.) will be identified in the report.
- Site Conceptual Model: A conceptual model of the Site will be developed, based on contaminant identification, exposure assessment, toxicity assessment, and risk characterization.

- Final Human Health Risk Assessment Report. CDM Smith will review that all comments are addressed.

3.7.2 Ecological Risk Assessment

CDM Smith will review and provide comments on the PRP's evaluation of the ecological risk posed by the site contaminants.

CDM Smith will review the following reports:

- Draft Ecological Risk Assessment Report. CDM Smith will review this report and ensure that it addresses the following appropriately:
  - Hazard Identification (sources): Available information on the hazardous substances present at the Site will be reviewed and the major contaminants of environmental concern will be identified.
  - Characterization of Site and Potential Receptors: Environmental exposure pathways will be identified and characterized.
  - Select Chemicals, Indicator Species, and End Points: Representative chemicals, indicator species (species that are especially sensitive to environmental contaminants), and end points will be selected.

- Exposure Assessment: The exposure assessment will identify the magnitude of actual or environmental exposures, the frequency and duration of these exposures, and the routes by which receptors are exposed.
- Toxicity Assessment/Ecological Effects Assessment: The toxicity and ecological effects assessment will address the types of adverse environmental effects associated with chemical exposures, the relationships between magnitude of exposure and adverse effects, and the related uncertainties for contaminant toxicity (e.g., weight of evidence for a chemical's carcinogenicity).
- Risk Characterization: As part of the risk characterization, compare chemical-specific toxicity information, combined with quantitative and qualitative information from the exposure assessment, to measured levels of contaminant exposure levels and the levels predicted through environmental fate and transport modeling.
- Identification of Limitations/Uncertainties: Critical assumptions (e.g., background concentrations and conditions) and uncertainties in the report will be identified.
- Site Conceptual Model: A conceptual model of the Site will be developed based on contaminant identification, exposure assessment, toxicity assessment, and risk characterization.

- Final Ecological Risk Assessment Report. CDM Smith will review that all comments are addressed.

3.8 Task 8 – Treatability Study and Pilot Testing Oversight - Optional

This task identifies technologies that may be suitable to the Site to determine whether there is a need to conduct treatability studies to better estimate costs and performance capabilities. At present, it is unknown whether a bench test or pilot study will be conducted. However, should a bench test or pilot test be determined as necessary, the PRP will submit a test plan identifying the goals of the study, which will be subsequently reviewed by CDM Smith. The treatability study will determine the suitability of remedial technologies to site conditions and problems.

The three levels of treatability studies include:

- Laboratory screening: The laboratory screening is used to establish the validity of technology to treat waste and is normally conducted during the FS.
- Bench-scale testing: Bench-scale testing is used to identify the performance of the technology specific to a type of waste for an operable unit, often conducted during the FS.
- Pilot-scale testing: Pilot-scale testing is used to provide quantitative performance, cost, and design information for remediation and is typically performed during RI/FS (*Guide for Conducting Treatability Studies Under CERCLA*, August 1993).

3.8.1 Review PRP Work Plan for Treatability Study/ Pilot Test - *Optional*

CDM Smith will review and provide comments to the PRP's Treatability Study Work Plan and submit to the RPM for review and approval. Once the PRP's Final Treatability Study Work Plan is completed, and the specifics of the scope are established, CDM Smith will then provide detail on the oversight activities that will be performed. CDM Smith will outline a schedule for oversight activities, an estimate of the number of split samples that will be accepted, and a plan for communication with the RPM.

3.8.2 Bench Test Oversight (Split Sampling) – Optional

Once the scope is established in the PRP's Final Treatability Study Work Plan, CDM Smith will provide detail on the oversight activities to be performed under this Subtask.

3.8.3 Prepare Field Investigation Oversight Reports – Optional

Once the scope is established in the PRP's Final Treatability Study Work Plan, CDM Smith will provide detail on the oversight activities to be performed under this Subtask.

3.8.4 Pilot Scale Test Oversight – *Optional*

Once the scope is established in the PRP's Final Treatability Study Work Plan, CDM Smith will provide detail on the oversight activities to be performed under this Subtask.

3.8.5 Prepare Pilot Scale Test Oversight Reports – *Optional*

Once the scope is established in the PRP's Final Treatability Study Work Plan, CDM Smith will provide detail on the oversight activities to be performed under this Subtask.

3.8.6 Field Test Oversight – *Optional*

Once the scope is established in the PRP's Final Treatability Study Work Plan, CDM Smith will provide detail on the oversight activities to be performed under this Subtask.

3.8.7 Prepare Field Test Oversight Reports – *Optional*

Once the scope is established in the PRP's Final Treatability Study Work Plan, CDM Smith will provide detail on the oversight activities to be performed under this Subtask.

3.8.8 Review PRP's Treatability Study Report – *Optional*

CDM Smith will review and provide comments on the PRP's Treatability Study Report after receipt of the Treatability Study Report. The review will concentrate on the performance of the technology, the study results of the technology or vendor compared with the performance standards established for the Site, the treatment technology's effectiveness, implementability, cost, and final results compared with the predicted results, and also an evaluation of a full-scale application of the technology, including a sensitivity analysis identifying the key parameters affecting full-scale operation.

3.9 Task 9 – Review of the PRP's Remedial Investigation Report

This task covers the review of the PRP's RI Report. CDM Smith will perform a technical review and provide comments in the form of a Technical Memorandum. CDM Smith will identify data gaps that may be important for completing the Human Health and Ecological Risk Assessments and the Feasibility Study.

3.9.1 Review PRP's Draft RI Report

CDM Smith will review and provide comments on the PRP's Draft RI Report after receipt of the PRP's Draft RI Report.

3.9.2 Review PRP's Final RI Report

CDM Smith will review and provide comments on the PRP's Final RI Report after receipt of the PRP's Final RI Report.

3.10 Task 10 – Remedial Alternatives Screening

This task covers the review of the PRP's hazardous waste management alternatives that will remediate or control contaminated media (soil, groundwater, air) remaining at the Site, as deemed necessary in the RI, to provide adequate protection of human health and the environment.

3.10.1 Review PRP's Draft Technical Memorandum

CDM Smith will review the PRP's draft Technical Memorandum after receipt of the document, presenting the potential alternatives and including the following information:

3.10.2 Establish Remedial Action Objectives

Based on existing information, CDM Smith will review the PRP's site-specific remedial action objectives which should be developed to protect human health and the environment. The objectives should specify the contaminant(s) and media of concern, the exposure route(s) and receptor(s), and an acceptable contaminant level or range of levels for each exposure route (i.e., preliminary remediation goals).

3.10.3 Establish General Response Actions

CDM Smith will review the PRP's proposed general response actions for each medium of interest by defining contaminant, treatment, excavation, pumping, or other actions, singly or in combination to satisfy remedial action objectives. The response actions consider requirements for protectiveness as identified in the remedial action objectives and the chemical and physical characteristics of the Site.

3.10.4 Identify & Screen Applicable Remedial Technologies

CDM Smith will review the PRP's proposed technologies based on the developed general response actions. Hazardous waste treatment technologies will be identified and screened to ensure that only those technologies applicable to the contaminants present, their physical matrix, and other site characteristics will be considered. This screening will be based primarily on a

technology's ability to effectively address the contaminants at the Site but will also consider a technology's implementability and cost. CDM Smith will review the PRP's selected representative process options, as appropriate, to carry forward into alternative development. CDM Smith will identify the need for treatability testing for those technologies that are probable candidates for consideration during the detailed analysis.

3.10.5 Review PRP Remedial Alternatives in Accordance with NCP

CDM Smith will review the PRP's Remedial Alternatives in accordance with the NCP, 40 CFR Part 300 and the Guidance for Conducting RI/FS Under CERCLA (OSWER Directive 9355.3-01).

3.10.6 Review of PRP's Remedial Alternatives for Effectiveness, Implementability, and Cost

CDM Smith will review the alternatives to identify the potential technologies or process options that will be combined into media-specific or site-wide alternatives. The developed alternatives shall be defined with respect to size and configuration of the representative process options; time for remediation; rates of flow or treatment; spatial requirements; distances for disposal; and required permits, imposed limitations, and other factors necessary to evaluate the alternatives. If many distinct, viable options are available and developed, the Research Engineer will screen the alternatives that undergo the detailed analysis to provide the most promising process options. The alternatives should be screened on a general basis with respect to their effectiveness, implementability, and cost.

3.10.7 Review of PRP's Final Technical Memorandum

CDM Smith will review the PRP's Final Technical Memorandum after receipt of the PRP's document.

3.11 Task 11 Review PRP's Remedial Alternatives Evaluation

This task covers the review of the PRP's Remedial Alternatives Evaluation. CDM Smith will review and provide comments. CDM Smith will comment whether the PRP has followed evaluation procedures as outlined in the NCP, 40 CFR Part 300 and the Guidance for Conducting RI/FS under CERCLA (OSWER Directive 9355.3-01). The report shall include:

- A technical description of each alternative that outlines the waste management strategy involved and identifies the key ARARs associated with each alternative.
- A discussion that profiles the performance of that alternative with respect to each evaluation criteria.

3.12 Task 12 Review PRP's FS Report

CDM Smith will review the PRP's FS. The FS report should consist of a detailed analysis of alternatives and cost-effectiveness analysis in accordance with NCP 300.68(h)(3)(I)(2). The report shall contain: 1) A summary of alternative remedial actions in accordance with NCP Chapter 3; 2) Cost Analysis in accordance with NCP Chapter 7; 3) Institutional analysis in accordance with NCP Chapter 4; 4) Public-health analysis in accordance with NCP Chapter 5; and 5) Environmental analysis in accordance with NCP Chapter 6.

3.12.1 Review PRP's Draft FS Report

CDM Smith will review and provide comments on the PRP's draft FS Report. The review of the FS Report should include a review of the following:

- FS Objectives summary
- Remedial Objective summary
- General Response Action
- Identification and Screening of Remedial Technologies
- Remedial Alternatives Description
- Detailed Analysis of Remedial Alternatives. CDM Smith's technical feasibility considerations will include the careful study of any problems that may prevent a remedial alternative from mitigating site problems. Therefore, the site characteristics from the RI must be kept in mind as technical feasibility of alternatives is studied. Specific items to be addressed are reliability (operation over time), safety, operation and maintenance, ease with which the alternative can be implemented, and time needed for implementation.
- Summary and Conclusions

3.12.2 Review PRP's Final FS Report

CDM Smith will review and provide comments on the PRP's Final FS Report after receipt of the document.

3.13 Task 13 Post RI/FS Support

This task includes efforts to support the Agency's ROD. Activities CDM Smith may be asked to perform include:

- Attend technical meetings, public meetings, briefings, public hearings
- Provide technical assistance in the preparation of the ROD
- Review the PRP FS Addendum
- Provide technical assistance in the preparation of the Responsiveness Summary

3.14 Task 14 - Work Assignment Closeout

Upon notification from EPA that the technical work under the WA is complete, CDM Smith will perform the necessary activities to close out this WA in accordance with contract requirements.

3.14.1 Document Indexing

CDM Smith will organize the WA files in its possession in accordance with the currently approved EPA file index structure. CDM Smith will duplicate, distribute and store files as part of contract

closeout, as directed by the EPA RPM. CDM Smith will archive files in accordance with EPA Records Center requirements.

3.14.2 Document Retention/Conversion

CDM Smith will convert all pertinent paper files into an appropriate long-term storage format. EPA will define the specific long-term storage format prior to close-out of this WA.

This page intentionally left blank.

Section 4
References

CDM Smith. 2017. *Revised Technical Memorandum – Summary of Existing Information and Data Gap Evaluation, Pierson's Creek Site*: CDM Smith Inc.

_____. 2018. *Region 2 RAC2 Remedial Action Contract Quality Management Plan, Revision 3*: CDM Smith Inc.

EarthSoft Inc. 2008. *Standalone EQuIS Data Processor (EDP) User Guide*: EarthSoft Inc.

U.S. Environmental Protection Agency. 2018. *Statement of Work for Remedial Investigation/Feasibility Study Oversight, Pierson's Creek Operable Unit 2*. Newark, New Jersey: U.S. Environmental Protection Agency.

_____. 2018. *Basic Manual for Historic Electronic Data*: U.S. EPA. February.

_____. 2016a. *Electronic Data Deliverable (EDD) Comprehensive Specification Manual 4.0*: U.S. EPA.

_____. 2016b. *Superfund Community Involvement Handbook*: U.S.EPA.

_____. 2015. *Electronic Data Deliverable Valid Values Reference Manual*: U.S. EPA. June.

_____. 2014. *Contract Laboratory Program Guidance for Field Samplers*. 540-R-014-013. October.

_____. 2012. Revision 1, Optimized UFP-QAPP Worksheets. March.

_____. 2006. *Data Quality Assessment: A Reviewer's Guide*: EPA QA/G-9R. EPA/240/B-06/002: U.S. EPA.

_____. 2005a. *Contaminated Sediment Remediation Guidance for Hazardous Waste Sites*: EPA-540-R-05-012: U.S. EPA.

_____. 2005b. *Uniform Federal Policy for Quality Assurance Project Plans: Evaluating, Assessing, and Documenting Environmental Data Collection and Use Programs – Part 1: UFP-QAPP Manual*. EPA-505-B-04-900A: U.S. EPA. March.

_____. 2001. EPA Requirements for Quality Assurance Project Plans (EPA QA/R-5). EPA/240/B-01/003. March.

_____. 1993. *Guide for Conducting Treatability Studies under CERCLA.* EPA/540/R-93/519a. August.

_____. 1991. *Human Health Evaluation Manual Supplemental Guidance: "Standard Default Factors:"* OSWER Directive 9285.6-03: U.S. EPA.

_____. 1990. *Guidance for Data Usability in Risk Assessment*. EPA/540/R-92/003: U.S. EPA.

_____. 1989a. *Risk Assessment Guidance for Superfund, Volume II: Environmental Evaluation.* EPA/540/1-89/001: U.S. EPA.

_____. 1989b. *Risk Assessment Guidance for Superfund, Volume I: Human Health Evaluation Manual,* Interim Final: U.S. EPA.

_____. 1989c. *Air/Superfund National Technical Guidance Study Series Volumes I, II, III, IV*: U.S. EPA.

_____. 1989d. *Ecological Assessment of Hazardous Waste Sites: A Field Laboratory Reference Document.* EPA-600-3-89-013: U.S. EPA.

_____. 1988a. *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, Interim Final.* EPA/540/G-89/004: U.S. EPA.

Tables

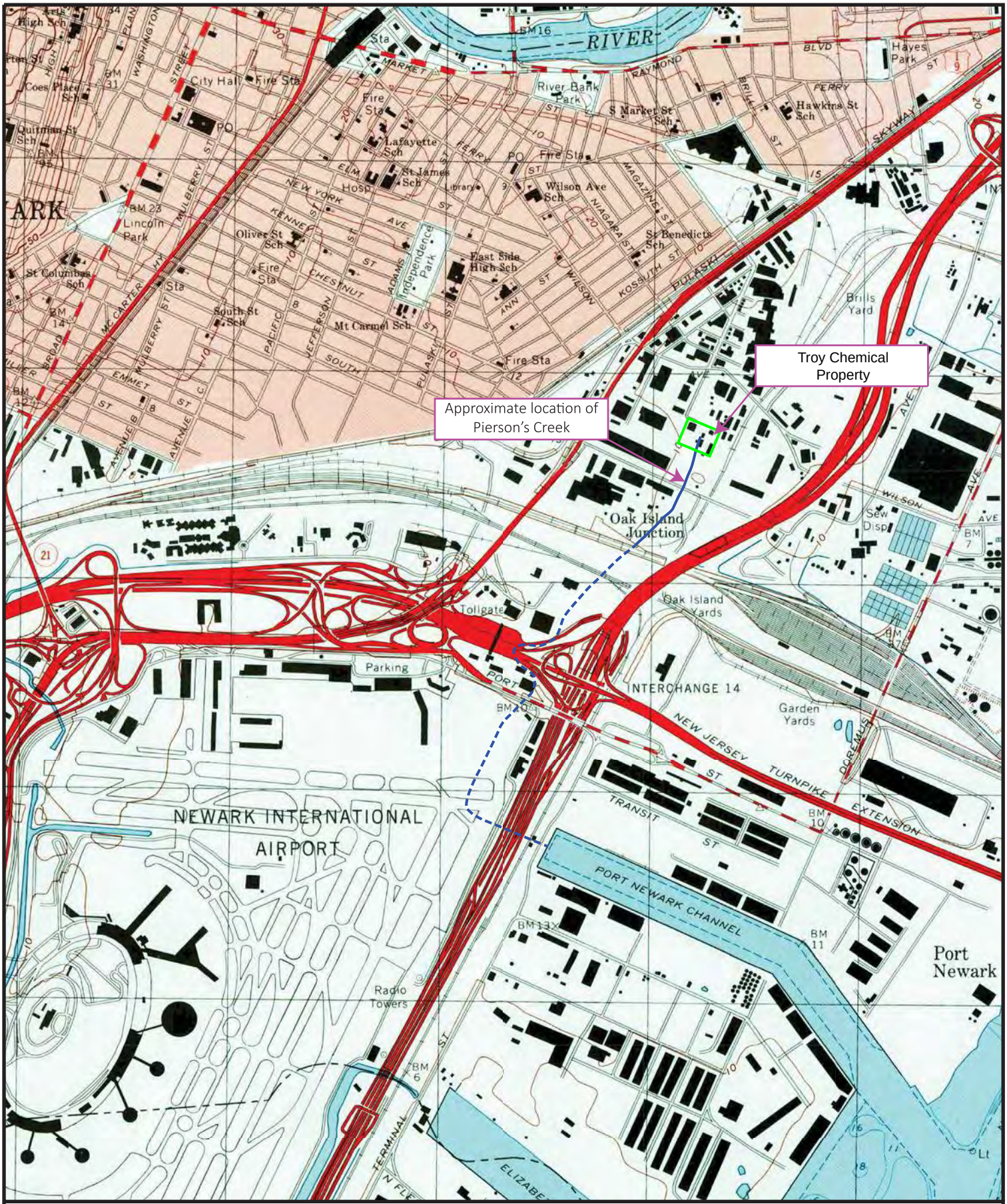
Table 3-1
Remedial Investigation Sample List
Pierson's Creek OU2
Newark, New Jersey

Event	Matrix	Analyses	Analytical Method	PRP Sample Information						EPA Sample Information
				Sample Count	Duplicates	Field Blanks	Trip Blanks	MS/MSD	Total	Split Samples
Supplemental Surface Soil	Soil	VOCs	EPA 8260C	12	1	2	NA	1	16	2
		SVOCs	EPA 8270D	12	1	2	NA	1	16	2
		Metals	EPA 6010C	12	1	2	NA	1	16	2
		Mercury	EPA 7471B	12	1	2	NA	1	16	2
		EPH	NJDEP EPH	12	1	2	NA	1	16	2
		PCBs	EPA 8082A	12	1	2	NA	1	16	2
Supplemental Subsurface Soil	Soil	VOCs	EPA 8260C	36	2	2	NA	1	41	4
		SVOCs	EPA 8270D	36	2	2	NA	1	41	4
		Metals	EPA 6010C	36	2	2	NA	1	41	4
		Mercury	EPA 7471B	36	2	2	NA	1	41	4
		EPH	NJDEP EPH	36	2	2	NA	1	41	4
		PCBs	EPA 8082A	36	2	2	NA	1	41	4
Additional Characterization of Shallow Groundwater	Groundwater	VOCs	EPA 8260C	4	1	3	3	1	12	1
		SVOCs	EPA 8270D	4	1	3	NA	1	9	1
		Metals	EPA 6010C	4	1	3	NA	1	9	1
		Mercury	EPA 7471B	4	1	3	NA	1	9	1
		EPH	NJDEP EPH	4	1	3	3	1	12	1
		PCBs	EPA 8082A	4	1	3	NA	1	9	1
	Soil	VOCs	EPA 8260C	4	1	3	NA	1	9	1
		SVOCs	EPA 8270D	4	1	3	NA	1	9	1
		Metals	EPA 6010C	4	1	3	NA	1	9	1
		Mercury	EPA 7471B	4	1	3	NA	1	9	1
		EPH	NJDEP EPH	4	1	3	NA	1	9	1
		PCBs	EPA 8082A	4	1	3	NA	1	9	1
	Groundwater	VOCs	EPA 8260C	10	1	3	3	1	18	1
		Dissolved Metals	EPA 6010C	10	1	3	NA	1	15	1
		Mercury	EPA 7471B	10	1	3	NA	1	15	1
Characterization of Immediate/Deep Groundwater	Soil	VOCs	EPA 8260C	1	1	3	NA	1	6	1
		SVOCs	EPA 8270D	1	1	3	NA	1	6	1
		Metals	EPA 6010C	1	1	3	NA	1	6	1
		Mercury	EPA 7471B	1	1	3	NA	1	6	1
		EPH	NJDEP EPH	1	1	3	NA	1	6	1
		PCBs	EPA 8082A	1	1	3	NA	1	6	1
	Groundwater	VOCs	EPA 8260C	3	1	3	3	1	11	1
		Dissolved Metals	EPA 6010C	3	1	3	NA	1	8	1
		Mercury	EPA 7471B	3	1	3	NA	1	8	1
Vapor Intrusion	Air	Mercury	NIOSH 6009M	2	1	0	NA	1	4	1
		Benzene	TO 15	1	1	0	NA	1	3	1
		Vinyl Chloride + Mercury	TO 15 + NIOSH 6009M	1	1	0	NA	1	3	1
		Mercury + Benzene	TO 15 + NIOSH 6009M	5	1	0	NA	1	7	1

Notes:

1. Samples are based on PRP's RI/FS Draft Work Plan and subject to change based on the Final Work Plan.
2. PRP field investigations will take place over a period of 6 weeks. CDM Smith will assume 30 hours/week (3 days per week, 18 total days of oversight)
3. It is assumed that one trip blank per cooler per day is necessary.

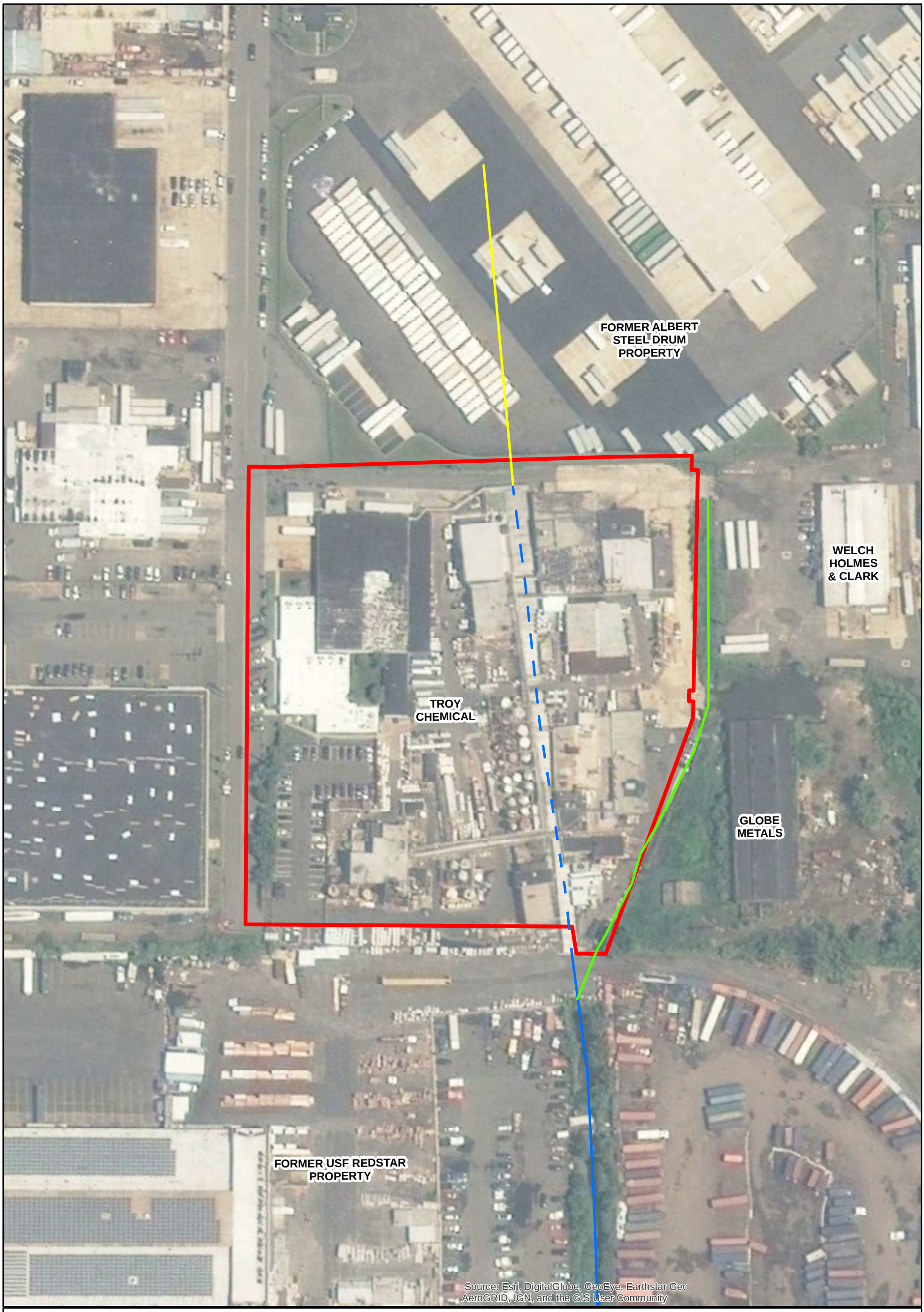
Figures



Source: USGS 7.5 Minute Quadrangle Map, Elizabeth, New Jersey

CDM Smith

Figure 1-1
Site Location
Pierson's Creek Superfund Site - OU2
Newark, NJ



Pierson's Creek Orientation

- Current Pierson's Creek Channel (open channel)
- Current Pierson's Creek Channel (culverted)
- Feeder Creeks
- Former Portion of Pierson's Creek
- Property boundary

N

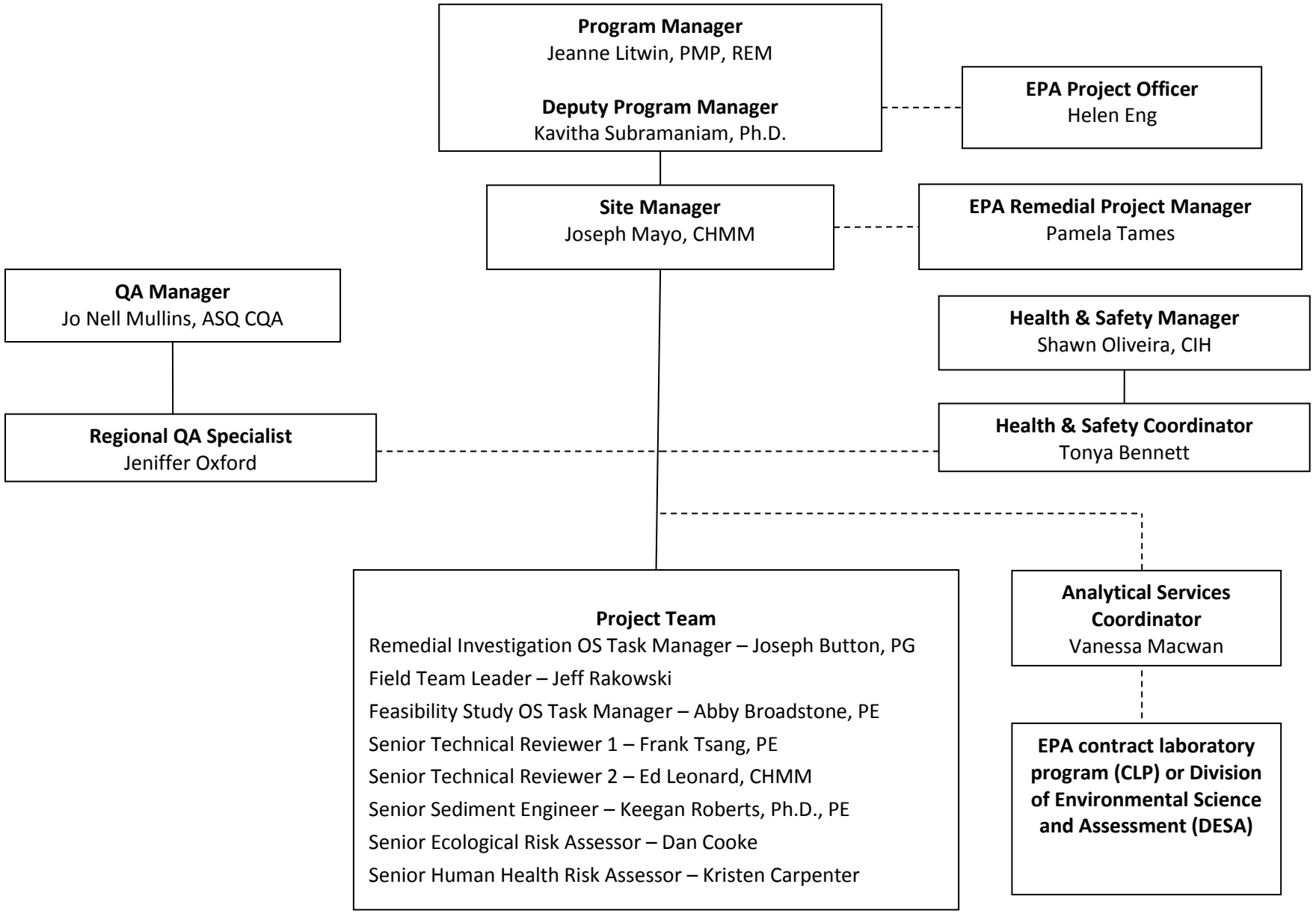
0 100 200 Feet

1 in = 100 feet

Figure 1-2
Site Map
Pierson's Creek Superfund Site - OU 2
Newark, NJ

CDM Smith

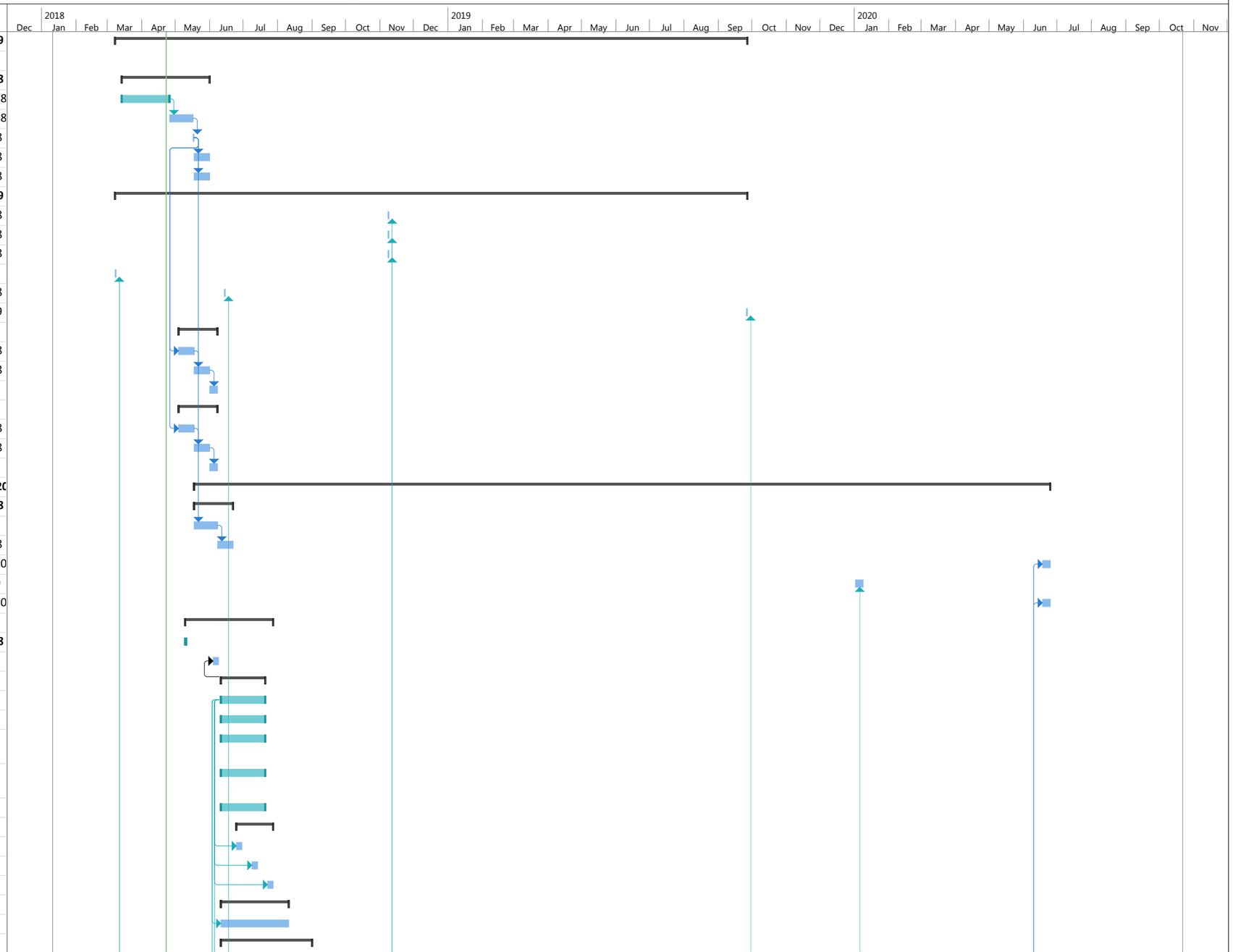
Figure 2-1
Pierson's Creek OU2 RI/FS Oversight
Project Organizational Chart



CDM Smith

Figure 2-2
Project Schedule
Pierson's Creek Superfund Site, OU2

ID	Task Name	Sub	Duration	Start	Finish
1	**Task 1 Project Planning and Support**		**406 days**	**Thu 3/8/18**	**Thu 9/26/19**
2	Project Administration				
3	**Work Plan**		**57 days**	**Wed 3/14/18**	**Thu 5/31/18**
4	Draft Work Plan Volumes 1 and 2		31 days	Wed 3/14/18	Wed 4/25/18
5	EPA Review of Draft Work Plan		15 days	Thu 4/26/18	Wed 5/16/18
6	Negotiate Work Plan Volume 2		1 day	Thu 5/17/18	Thu 5/17/18
7	Submit Final Work Plan Volume 1		10 days	Fri 5/18/18	Thu 5/31/18
8	Submit Negotiated Work Plan Volume 2		10 days	Fri 5/18/18	Thu 5/31/18
9	**Meetings**		**406 days**	**Thu 3/8/18**	**Thu 9/26/19**
10	Meeting 1 - RI Report		1 day	Thu 11/8/18	Thu 11/8/18
11	Meeting 2 - HHRA Report		1 day	Thu 11/8/18	Thu 11/8/18
12	Meeting 3 - SLERA Report		1 day	Thu 11/8/18	Thu 11/8/18
13	Meeting 4 - Remedial Alternatives Screening		1 day	Thu 3/8/18	Thu 3/8/18
14	Meeting 5 - Remedial Alternatives Evaluation		1 day	Thu 6/14/18	Thu 6/14/18
15	Meeting 6 - FS Report		1 day	Thu 9/26/19	Thu 9/26/19
16	**QAPP**		**25 days**	**Fri 5/4/18**	**Thu 6/7/18**
17	Prepare/Submit Draft QAPP		10 days	Fri 5/4/18	Thu 5/17/18
18	EPA Review of Draft QAPP		10 days	Fri 5/18/18	Thu 5/31/18
19	Prepare/Submit Final QAPP		5 days	Fri 6/1/18	Thu 6/7/18
20	**HASP**		**25 days**	**Fri 5/4/18**	**Thu 6/7/18**
21	Prepare/Submit Draft HASP		10 days	Fri 5/4/18	Thu 5/17/18
22	EPA Review of Draft QAPP		10 days	Fri 5/18/18	Thu 5/31/18
23	Prepare/Submit Final HASP		5 days	Fri 6/1/18	Thu 6/7/18
24	**Task 2 Community Involvement**		**549 days**	**Fri 5/18/18**	**Wed 6/24/20**
25	**Community Relations Plan**		**25 days**	**Fri 5/18/18**	**Thu 6/21/18**
26	Draft Community Relations Plan		15 days	Fri 5/18/18	Thu 6/7/18
27	Final Community Relations Plan		10 days	Fri 6/8/18	Thu 6/21/18
28	Public Meeting Support		5 days	Thu 6/18/20	Wed 6/24/20
29	Fact Sheet Preparation		5 days	Thu 1/2/20	Wed 1/8/20
30	Public Notice		5 days	Thu 6/18/20	Wed 6/24/20
31	**Task 3 Data Acquisition and RI/FS Oversight**		**57 days**	**Thu 5/10/18**	**Fri 7/27/18**
32	**Site Visit**		**1 day**	**Thu 5/10/18**	**Thu 5/10/18**
33	**Mobilization**		**5 days**	**Mon 6/4/18**	**Fri 6/8/18**
34	**Field Sampling Events**		**30 days**	**Mon 6/11/18**	**Fri 7/20/18**
35	Supplemental Surface Soil Sampling		30 days	Mon 6/11/18	Fri 7/20/18
36	Supplemental Soil Boring Sampling		30 days	Mon 6/11/18	Fri 7/20/18
37	Additional Characterization of Shallow Groundwater		30 days	Mon 6/11/18	Fri 7/20/18
38	Characterization of Immediate/Deep Groundwater		30 days	Mon 6/11/18	Fri 7/20/18
39	Vapor Intrusion Sampling (if necessary)		30 days	Mon 6/11/18	Fri 7/20/18
40	**RI/FS Field Investigation Oversight Reports**		**25 days**	**Mon 6/25/18**	**Fri 7/27/18**
41	Field Investigation Oversight Report 1		5 days	Mon 6/25/18	Fri 6/29/18
42	Field Investigation Oversight Report 2		5 days	Mon 7/9/18	Fri 7/13/18
43	Field Investigation Oversight Report 3		5 days	Mon 7/23/18	Fri 7/27/18
44	**Task 4 Analysis of Split Samples**		**45 days**	**Mon 6/11/18**	**Fri 8/10/18**
45	Analytical Services Provided via CLP or DESA		45 days	Mon 6/11/18	Fri 8/10/18
46	**Task 5 Analytical Support and and Data Validation**		**60 days**	**Mon 6/11/18**	**Fri 8/31/18**

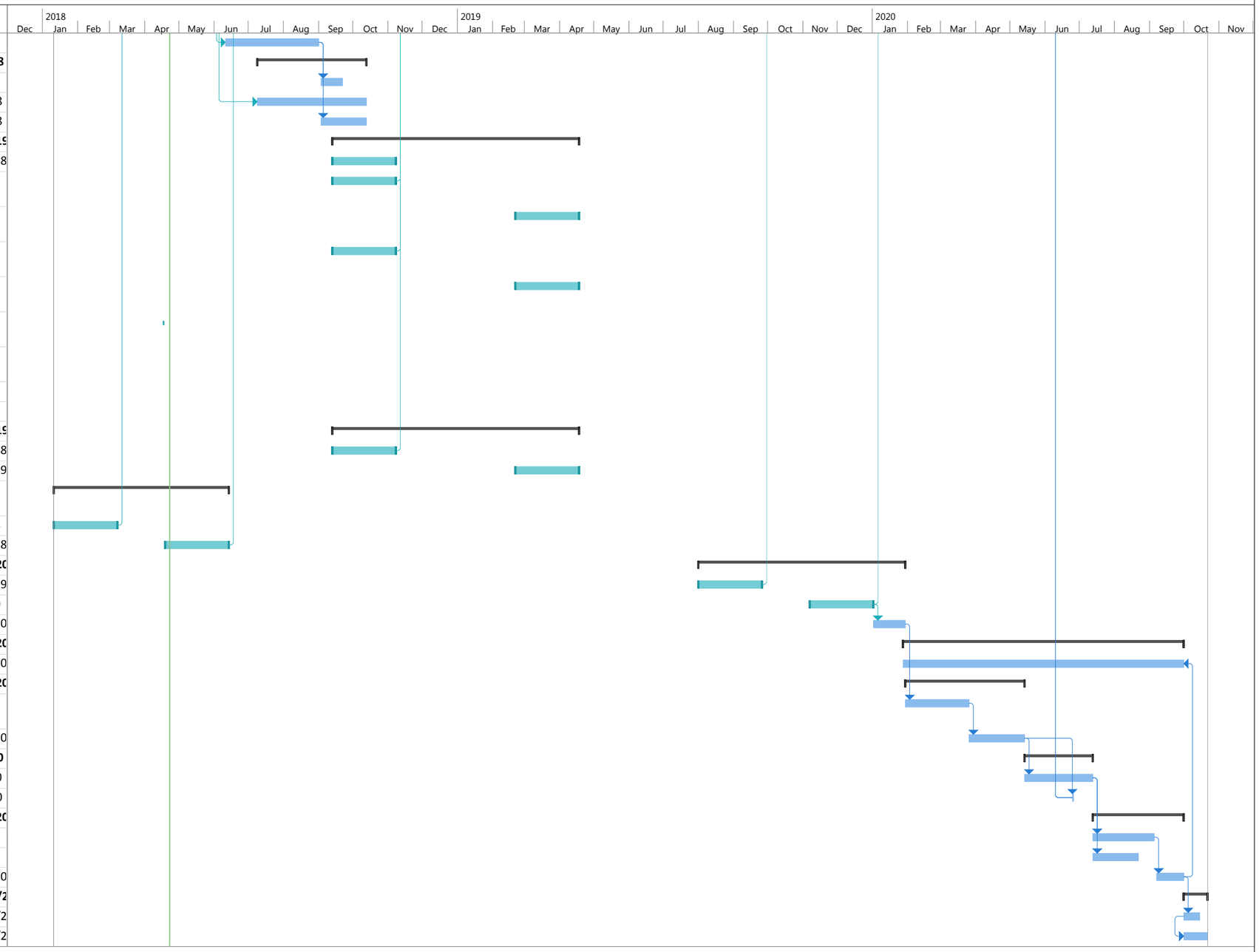


Project: 077 Pierson's OU2 sche
Date: Mon 4/23/18

Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress

Figure 2-2
Project Schedule
Pierson's Creek Superfund Site, OU2

ID	Task Name	Sub	Duration	Start	Finish
47	Sample Management		60 days	Mon 6/11/18	Fri 8/31/18
48	**Task 6 Data Evaluation of Split Samples**		**70 days**	**Mon 7/9/18**	**Fri 10/12/18**
49	Data Usability Evaluation		15 days	Mon 9/3/18	Fri 9/21/18
50	Data Reduction, Tabulation, and Evaluation		70 days	Mon 7/9/18	Fri 10/12/18
51	Data Evaluation Report		30 days	Mon 9/3/18	Fri 10/12/18
52	**Task 7 Review of PRP Risk Assessment**		**155 days**	**Thu 9/13/18**	**Wed 4/17/19**
53	Review of PRP's Pathway Analysis Report		40 days	Thu 9/13/18	Wed 11/7/18
54	Review of PRP's Draft Human Health Risk Assessment		40 days	Thu 9/13/18	Wed 11/7/18
55	Review of PRP's Final Human Health Risk Assessment		40 days	Thu 2/21/19	Wed 4/17/19
56	Review of PRP's Draft Ecological Risk Assessment		40 days	Thu 9/13/18	Wed 11/7/18
57	Review of PRP's Final Ecological Risk Assessment		40 days	Thu 2/21/19	Wed 4/17/19
58	**Task 8 Treatability Study and Pilot Testing Oversight (optional - schedule to be determined)**				
59	Review PRP Work Plan for Treatability Study/Pilot Test				
60	Treatability Study Oversight				
61	Review PRP's Treatability Study Report				
62	**Task 9 Review of the PRP's RI Report**		**155 days**	**Thu 9/13/18**	**Wed 4/17/19**
63	Review of PRP's Draft RI Report		40 days	Thu 9/13/18	Wed 11/7/18
64	Review of PRP's Final RI Report		40 days	Thu 2/21/19	Wed 4/17/19
65	**Task 10/11 Remedial Alternatives Screening and Evaluation**		**110 days**	**Thu 1/11/18**	**Wed 6/13/18**
66	Review of PRP's Draft Technical Memorandum		40 days	Thu 1/11/18	Wed 3/7/18
67	Review of PRP's Final Technical Memorandum		40 days	Thu 4/19/18	Wed 6/13/18
68	**Task 12 Review of PRP's FS Report**		**130 days**	**Thu 8/1/19**	**Wed 1/29/20**
69	Review PRP's Draft FS Report		40 days	Thu 8/1/19	Wed 9/25/19
70	Review PRP's Final FS Report		40 days	Thu 11/7/19	Wed 1/1/20
71	PRP Final FS Submitted		20 days	Thu 1/2/20	Wed 1/29/20
72	**Task 13 Post RI/FS Support**		**177 days**	**Tue 1/28/20**	**Wed 9/30/20**
73	Technical Support		177 days	Tue 1/28/20	Wed 9/30/20
74	**Proposed Plan**		**75 days**	**Thu 1/30/20**	**Wed 5/13/20**
75	EPA prepares Draft Proposed Plan to ERRD, ORC, NJ		40 days	Thu 1/30/20	Wed 3/25/20
76	Final Proposed Plan to Public		35 days	Thu 3/26/20	Wed 5/13/20
77	**Public Comment Period**		**42 days**	**Wed 5/13/20**	**Sun 7/12/20**
78	Public Comment Period		60 edays	Wed 5/13/20	Sun 7/12/20
79	Proposed Plan Public Meeting		1 day	Thu 6/25/20	Thu 6/25/20
80	**Record of Decision**		**58 days**	**Mon 7/13/20**	**Wed 9/30/20**
81	Draft ROD to ERRD, ORC, PR		40 days	Mon 7/13/20	Fri 9/4/20
82	Responsiveness Summary		30 days	Mon 7/13/20	Fri 8/21/20
83	Final ROD for Signature		18 days	Mon 9/7/20	Wed 9/30/20
84	**Task 14 Workout Assignment Closeout**		**15 days**	**Thu 10/1/20**	**Wed 10/21/2**
85	Document Indexing		10 days	Thu 10/1/20	Wed 10/14/2
86	Document Retention/Conversion		15 days	Thu 10/1/20	Wed 10/21/2



Project: 077 Pierson's OU2 sche
Date: Mon 4/23/18

Task | Summary | Inactive Milestone | Duration-only | Start-only | External Milestone | Manual Progress
Split | Project Summary | Inactive Summary | Manual Summary Rollup | Finish-only | Deadline
Milestone | Inactive Task | Manual Task | Manual Summary | External Tasks | Progress